

GALT

***water pollution
control plant***

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ONTARIO WATER RESOURCES COMMISSION

Division of Plant Operations

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ONTARIO WATER RESOURCES COMMISSION

801 BAY STREET, TORONTO 5

OFFICE OF THE GENERAL MANAGER

Members of the Galt Local Advisory Committee,
City of Galt.

Gentlemen:

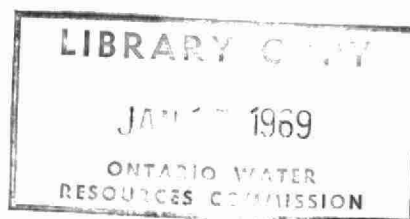
We are happy to present you with the 1967 Operating Summary for the
Galt Water Pollution Control Plant, OWRC Project No. 2-0090-61.

Your co-operation with our staff throughout the year has been appreciated.
Only with such co-operation can the war against water pollution be waged
effectively.

Yours very truly,

A handwritten signature in dark ink, appearing to read "D. S. Caverly".

D. S. Caverly,
General Manager.



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aswr



ONTARIO WATER RESOURCES COMMISSION

801 BAY STREET

TORONTO 5

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J. H. H. ROOT, M.P.P.
VICE-CHAIRMAN

D. S. CAVERLY
GENERAL MANAGER

W. S. MACDONNELL
COMMISSION SECRETARY

General Manager,
Ontario Water Resources Commission.

Dear Sir:

I am pleased to submit to you the 1967 Operating Summary for the Galt Water Pollution Control Plant, OWRC Project No. 2-0090-61.

The summary reviews progress during the year, outlines operating problems encountered and summarizes in graphs, charts and tables all significant flow and cost data.

Yours very truly,

A handwritten signature in dark ink, reading "D. A. McTavish". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

D. A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

FOREWORD

● This operating summary has been prepared in order to acquaint readers with the management of the project during 1967. The efficiency of the plant's operation is reflected in a general review. Significant financial details are recorded, and technical performance is illustrated by graphs and charts.

The summary should answer two salient questions. Are the project's facilities adequate at this time? And can the project meet future requirements?

The Regional Operations Engineer is primarily responsible for the preparation of the report, and will be pleased to answer any questions regarding it.

Most of the material for the graphs and charts was compiled by the statistics section of the Division of Plant Operations, with the final versions of the graphs being drawn by the draughting section of the Division of Sanitary Engineering. Cost data were provided by the Division of Finance.

It will be evident from the report that all of these groups co-operated with substantial success.

C O N T E N T S

Foreword	1
Title Page	3
'67 Review	5
Project Costs	6
Operating Costs	7
Process Data	11
Conclusions	Inside back cover



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GALT
water pollution control plant
operated for

THE CITY OF GALT

by the

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Assistant Director: C. W. Perry
Regional Supervisor: A. C. Beattie
Operations Engineer: B. W. Hansler

801 Bay Street Toronto 5

'67 REVIEW

A total of 2,079.485 million gallons of sewage was treated at the Galt Water Pollution Control Plant during the year at a total operating cost of \$99,195.65. The operating cost per million gallons and the cost per pound of BOD removed were \$47.70 and \$0.04 respectively. This represents an increase of \$3.80 per million gallons of sewage treated and \$0.01 per pound of BOD removed over the 1966 costs.

The average daily flow during the year was 5.70 million gallons. The design flow of 5.0 million gallons per day was exceeded 95.5 percent of the time.

The average BOD and suspended solids removal efficiencies were 88.1 percent and 88.3 percent respectively.

PROJECT COSTS

NET CAPITAL COST (Estimated)	\$1,211,259.48
DEDUCT - Portion Financed by CMHC (Estimated)	<u>804,304.16</u>
Long Term Debt to OWRC	\$ <u>406,919.32</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1967	\$ <u>75,089.48</u>
Debt Retirement	\$ 14,763.00
Reserve	7,857.46
Interest Charged	22,947.60
Net Operating	<u>99,195.65</u>
TOTAL	\$ <u>144,763.71</u>

RESERVE ACCOUNT

Balance at January 1, 1967	\$ 29,501.94
Deposited by Municipality	7,857.46
Interest Earned	<u>1,824.79</u>
	\$ 39,184.19
Less Expenditures	<u>(9,669.71)</u>
Balance at December 31, 1967	\$ <u>29,514.48</u>

MONTHLY OPERATING COSTS

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	* SUNDRY	WATER
JAN	5136.37	3460.71		495.85		369.92	(159.79)	56.31	857.50	55.87	
FEB	6113.80	2957.14		389.51	689.07	1407.39	318.65	18.51	157.52	72.99	103.02
MARCH	9014.94	4933.74		848.23	681.72	394.92	802.53	442.58	241.86	515.50	153.86
APRIL	9207.52	2721.98	141.38	355.81	710.70	3569.93	66.60	102.30	674.21	660.21	204.40
MAY	5559.18	3048.55	688.57	258.84	801.16	444.12	102.36		34.67	27.77	153.14
JUNE	7532.29	2721.98	794.31	168.40	752.72	621.87	215.82	292.82	1118.81	650.02	195.54
JULY	9536.07	2375.73	1540.37		700.03	3320.52	520.60		282.34	544.62	251.86
AUG	7196.82	2360.40	1289.79		722.35	1643.18	274.24		369.88	311.42	225.62
SEPT	9542.70	4298.45	1629.00		686.53	2037.20	213.05	2.80	134.84	371.93	168.90
OCT	7119.22	2841.16	817.27	(14.00)	789.26	1142.78	241.59	7.56	506.92	493.38	293.30
NOV	9109.05	2849.73	853.60	135.92	776.67	1705.57	502.83		442.52	1645.77	196.44
DEC	14127.63	2927.43	705.68	253.80	1748.11	4318.95	171.32	193.89	1469.40	1953.12	385.93
TOTAL	99195.65	37497.00	8459.97	2892.36	9058.32	20976.35	3269.80	1116.77	6290.47	7302.60	2332.01

* SUNDRY INCLUDES SLUDGE HAULING COSTS WHICH WERE \$3,929.18
BRACKETS INDICATE CREDIT

YEARLY OPERATING COSTS

YEAR	M. G. TREATED	TOTAL COST	COST PER MILLION GALLONS	COST PER LB OF BOD REMOVED
1964	1895.161	\$77,875.88	\$41.09	3 CENTS
1965	1853.883	\$73,672.49	\$39.74	4 CENTS
1966	1903.925	\$83,578.97	\$43.90	3 CENTS
1967	2079.465	\$99,195.65	\$47.70	4 CENTS

VACUUM FILTER COSTS (MONTHLY)

MONTH	COST PER MONTH					TOTAL	COST PER TON DRY WEIGHT					TOTAL
	FeCl ₃	CAO	LABOUR	ELEC	MAINT		FeCl ₃	CAC	LABOUR	ELEC	MAINT	
JANUARY	191.77	290.67	374.00	48.08	74.80	979.32	4.07	6.17	7.93	1.02	1.59	20.73
FEBRUARY	216.29	377.42	500.50	43.13	100.10	1237.44	5.12	8.93	11.84	1.02	2.37	29.28
MARCH	237.32	405.86	528.00	51.95	105.60	1328.73	4.66	7.97	10.37	1.02	2.07	26.09
APRIL	66.38	131.57	143.00	13.35	28.60	382.90	5.07	10.05	10.93	1.02	2.19	29.26
MAY	247.54	373.92	484.00	38.45	96.80	1240.71	6.57	9.92	12.84	1.02	2.57	32.92
JUNE	307.58	504.41	572.00	67.60	114.40	1565.99	4.64	7.61	8.63	1.02	1.73	23.63
JULY	237.06	308.53	390.50	42.52	78.10	1056.71	5.69	7.40	9.37	1.02	1.87	25.35
AUGUST	260.38	334.96	451.00	41.47	90.20	1178.01	6.40	8.24	11.09	1.02	2.22	28.97
SEPTEMBER	266.11	441.62	473.00	62.21	94.60	1337.54	4.36	7.24	7.75	1.02	1.55	21.92
OCTOBER	311.53	532.71	572.00	70.64	114.10	1601.28	4.50	7.69	8.26	1.02	1.65	23.12
NOVEMBER	263.86	480.81	462.00	70.55	92.40	1369.62	3.82	6.95	6.68	1.02	1.34	19.81
DECEMBER	303.57	511.47	550.00	63.67	110.00	1538.71	4.86	8.19	8.81	1.02	1.76	24.64
TOTAL	2909.39	4693.95	5500.00	613.62	1100.00	14816.96	-	-	-	-	-	-
AVERAGE PER MONTH	242.45	391.16	458.33	51.14	91.67	1234.75	4.98	8.03	9.54	1.02	1.91	25.48

COMMENTS

Total filter costs have increased 42.7 percent over the previous years cost for a total cost of \$14,816.96 in 1967. As a result the filter will be shut down for a trial period in 1968 and liquid sludge haulage initiated. Cost comparisons of the two methods of sludge disposal will determine which of the two will be maintained.

MONTHLY OPERATING COSTS

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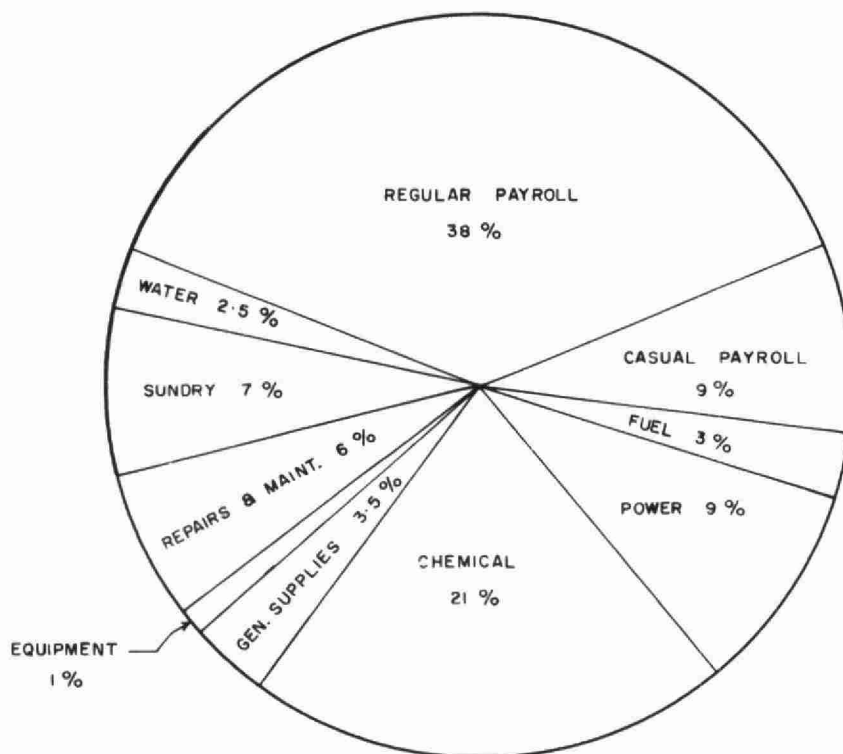
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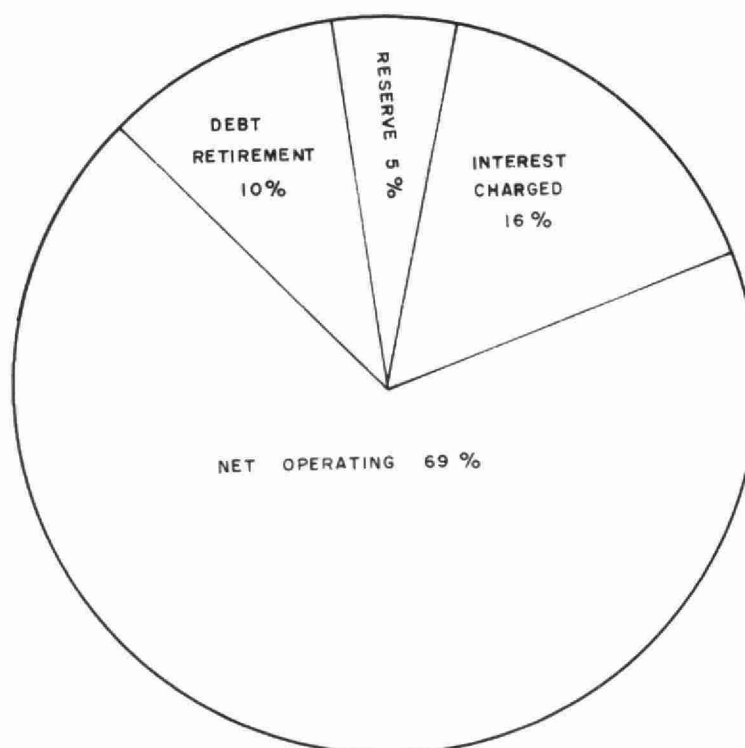
COMMENTS

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1967 OPERATING COSTS



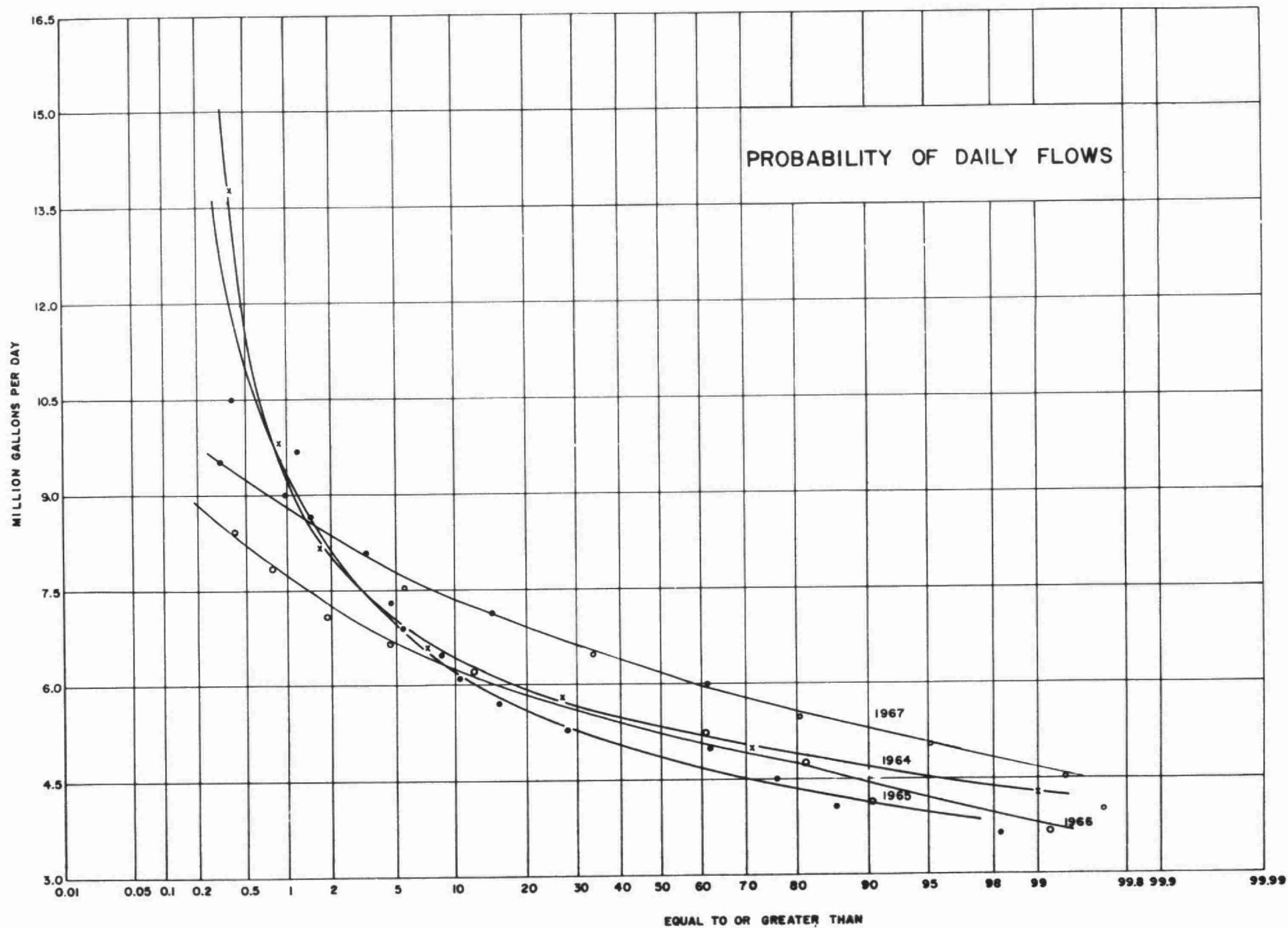
TOTAL ANNUAL COST

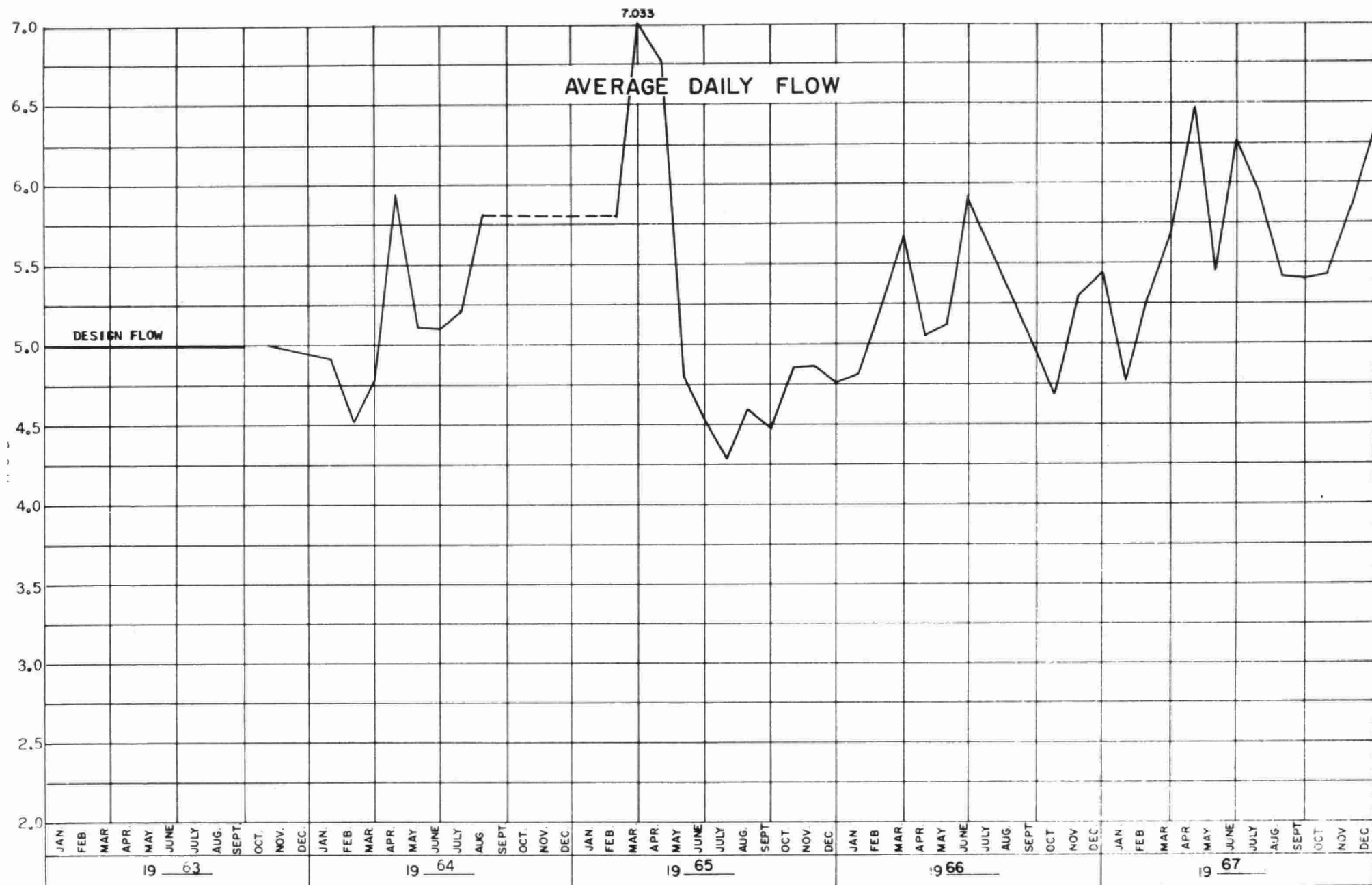


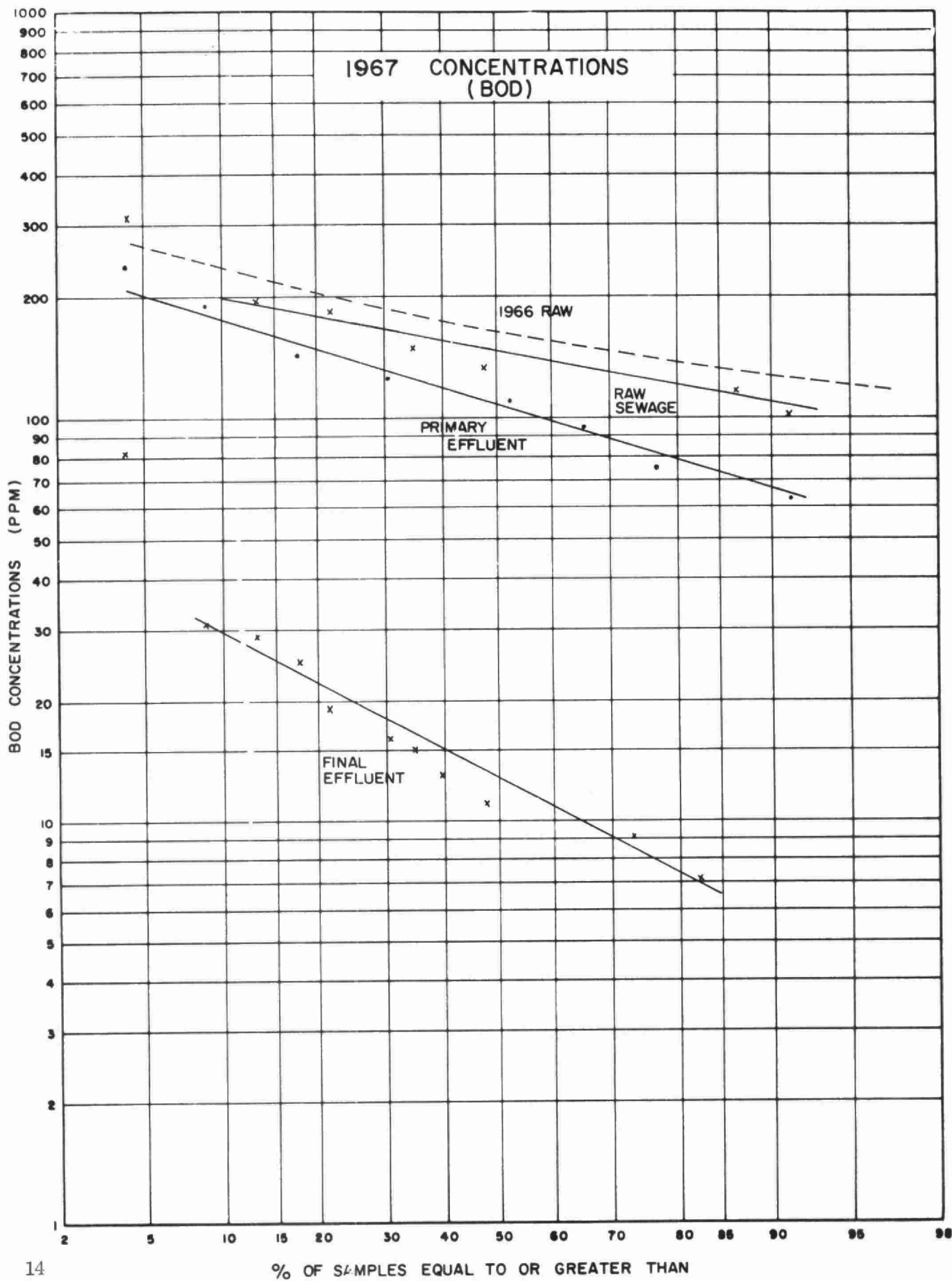
Process Data

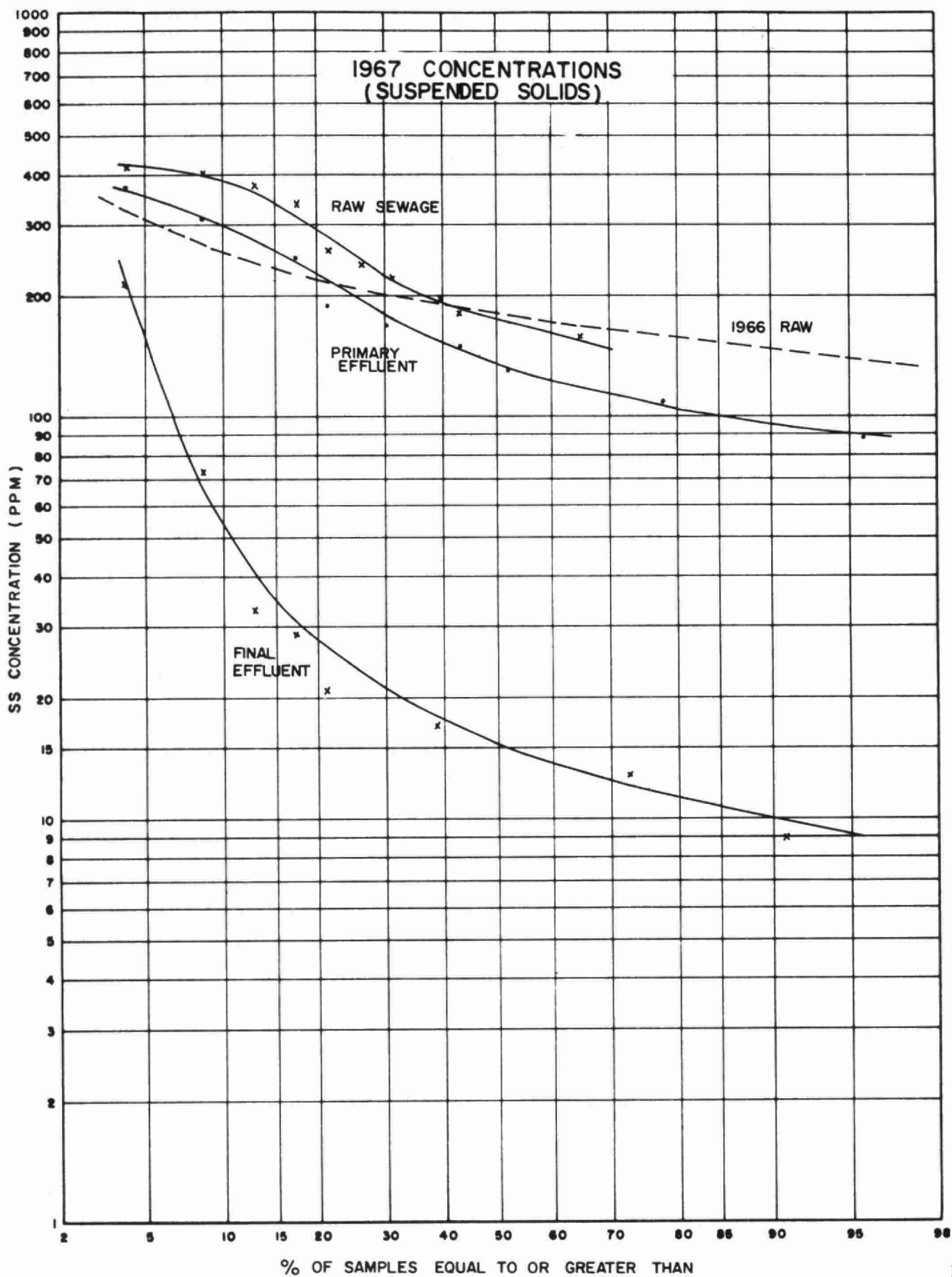
The average daily flows have increased considerably from 1966 to 1967. The plant design flow exceeded 65 percent of the time in 1966 and 95.5 percent of the time in 1967 as shown in the probability curves. The increased trend in flows is also well depicted in the average daily flow curve.

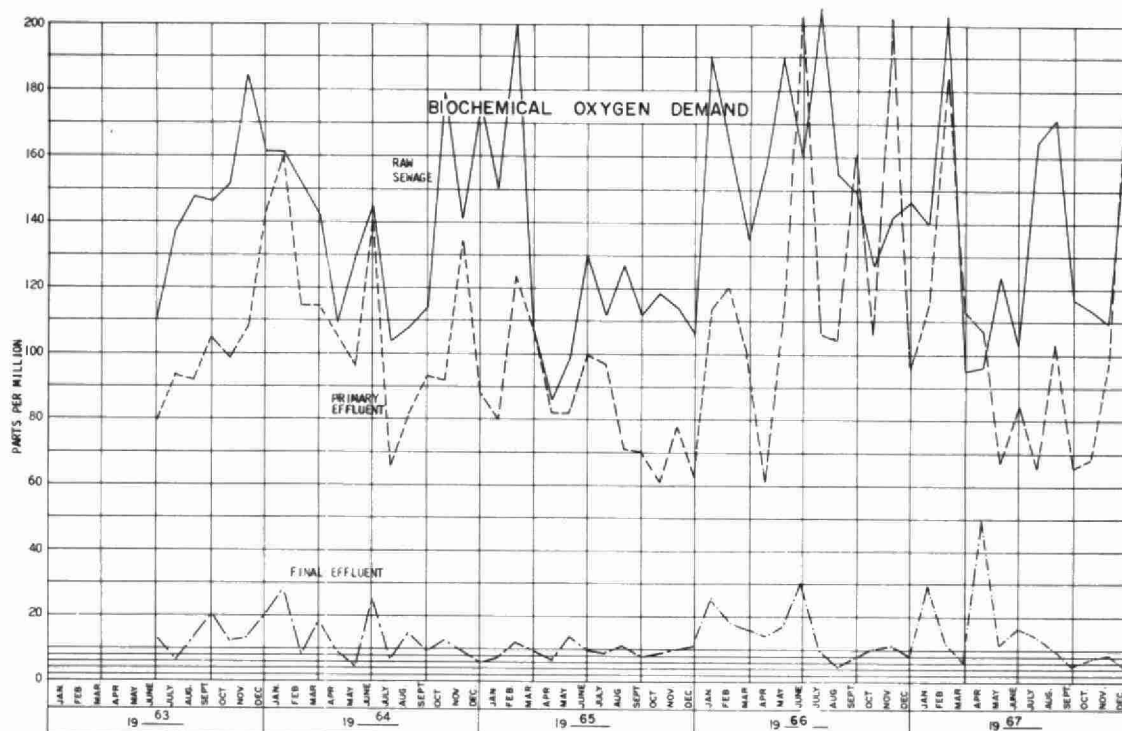
The final effluent BOD and suspended solids quality is illustrated in the operating result curves. Forty percent of the final effluent samples taken during the year exceeded OWRC objectives with respect to BOD concentration and 53 percent exceeded these objectives with respect to suspended solids concentration. The OWRC objective for both BOD and SS in the final effluent is 15 ppm.



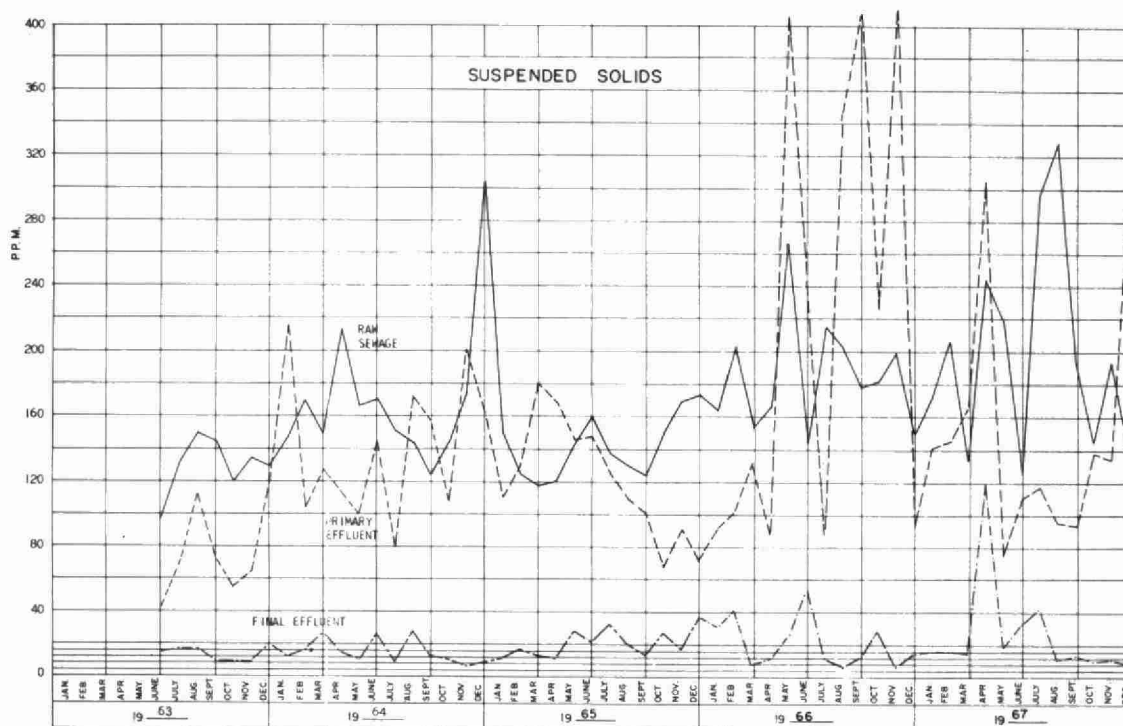








MONTHLY VARIATIONS



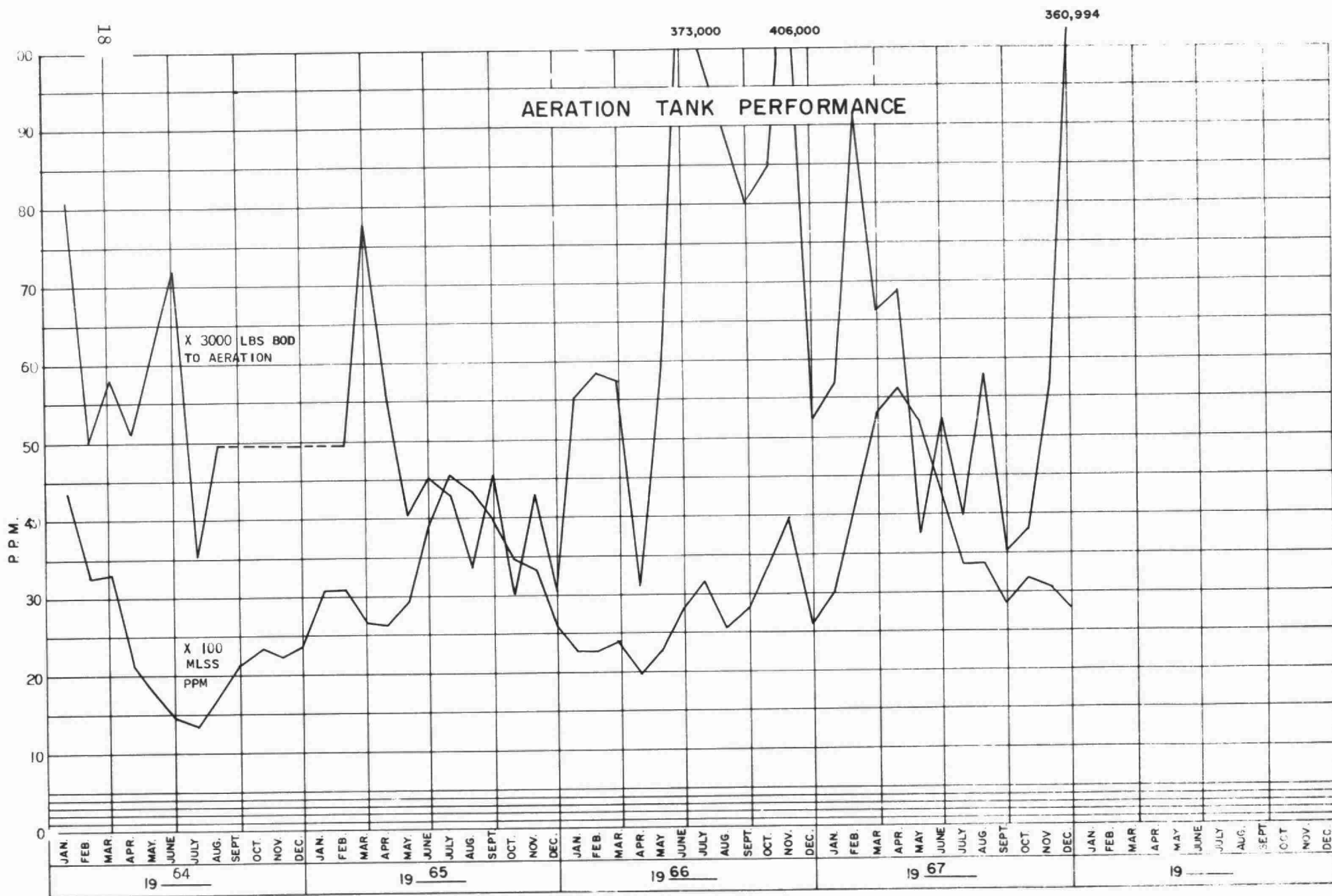
GRIT, B.O.D AND S.S. REMOVAL

MONTH	B. O. D.				S. S.				GRIT REMOVAL CU. FT.
	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	
JAN.	140	29	79.3	82.38	171	14	91.9	116.51	10
FEB.	245	12	95.1	172.99	205	14	93.2	141.81	9
MAR.	95	6.1	93.6	78.62	132	14	90.6	105.24	-
APR.	96	49	49.0	45.64	243	115	52.7	124.29	39
MAY	124	11	91.1	95.46	217	16	92.6	169.80	84
JUNE	102	16	84.3	81.02	124	30	75.8	88.55	4
JULY	165	14	91.5	138.94	296	41	86.1	234.64	19
AUG.	172	10	94.1	136.17	328	9	97.2	268.14	33
SEPT.	117	4.9	95.8	91.05	192	11	94.3	147.02	10
OCT.	114	6.7	94.1	90.59	143	8	94.4	113.98	4.5
NOV.	110	8	92.7	89.53	192	9	95.3	160.62	27
DEC.	175	4	97.7	166.84	130	6	95.4	120.98	52.5
TOTAL	-	-	-	1269.26	-	-	-	1791.58	292
AVG.	138	14.2	88.1	105.77	198	24	88.3	149.30	24

COMMENTS

The treatment system is designed for a raw sewage with a BOD and SS concentration of 250 ppm. The average raw sewage BOD concentration was 138 ppm, 55 percent of the design value; the average suspended solids concentration of 198 ppm was 79 percent of the design value.

The average effluent BOD and suspended solids concentrations were 14.2 ppm and 24 ppm respectively, representing a BOD reduction of 88.1 percent and a suspended solids reduction of 88.3 percent.



AERATION SECTION

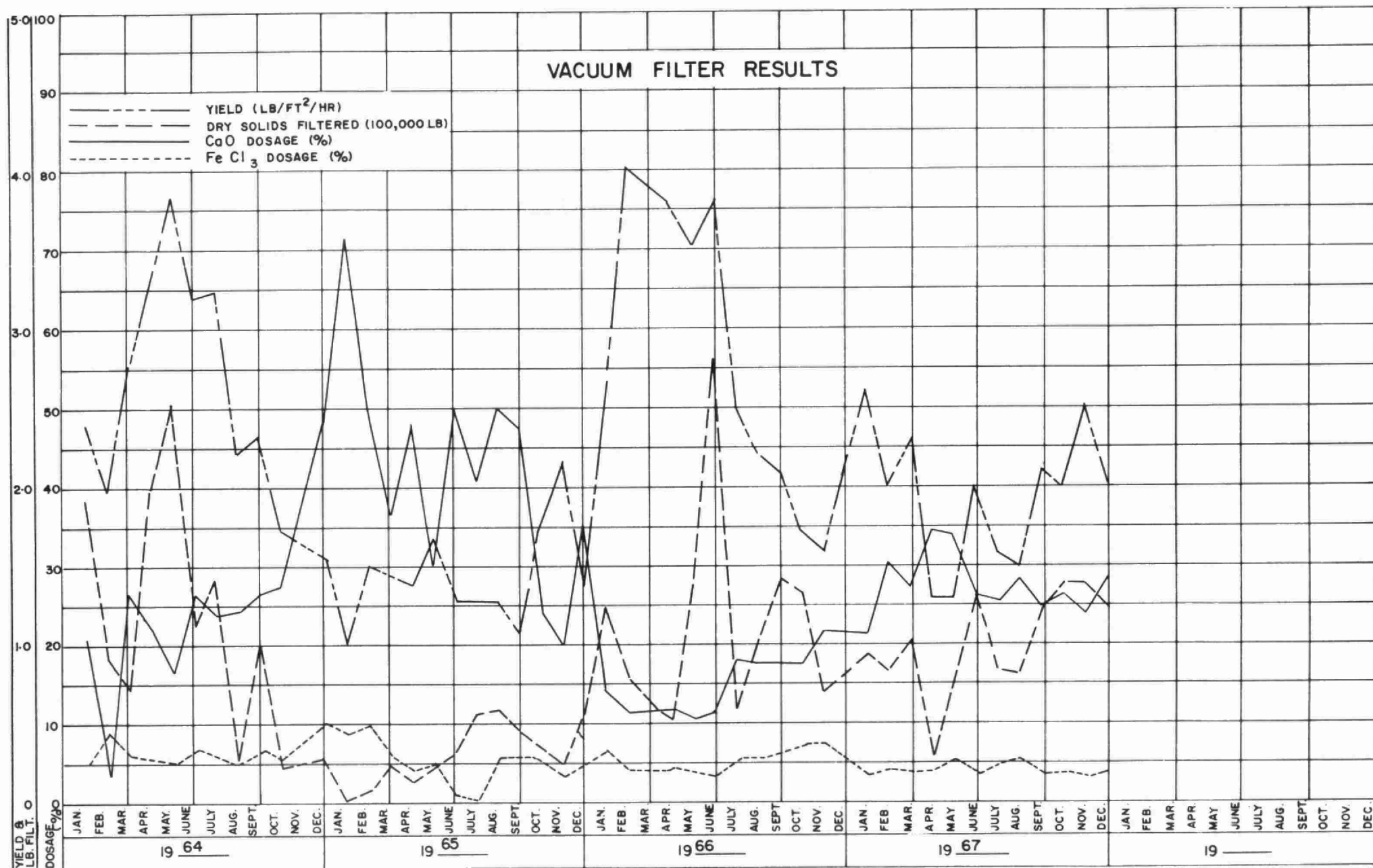
MONTH	PRIM. EFFL B.O.D. PPM.	MLSS. PPM.	LBS. BOD. PER 100 LBS. M. L. S. S.
JANUARY	115	3031	12
FEBRUARY	185	4218	16
MARCH	113	5300	8
APRIL	107	5620	8
MAY	67	5198	5
JUNE	84	4264	9
JULY	65	3369	10
AUGUST	103	3382	15
SEPTEMBER	65	2853	11
OCTOBER	68	3177	11
NOVEMBER	97	3058	17
DECEMBER	185	2755	33
TOTAL	-	-	-
AVERAGE	105	3852	13

COMMENTS

The average loading to the aeration section of 13 lbs. of BOD per 100 lbs. of MLSS produced very good treatment of the wastes.

The mechanical aerators had no difficulty in maintaining an adequate dissolved oxygen.

VACUUM FILTER RESULTS



VACUUM FILTER OPERATION

MONTH	% SOLIDS FILTRATE	FILTER HOURS	% SOLIDS DIGEST SLUDGE	LBS. DRY SOLIDS FILTERED	LBS. LIME (AS CAO)	% LIME (AS CAO)	LBS. FeCl ₃	% FeCl ₃	% SOLIDS FILTERED SLUDGE	YIELD PSF/HOUR
JAN.	0.6	124.5	5.1	94270	19950	21.2	2964	3.2	23.6	2.6
FEB.	0.3	166.0	3.7	84559	25905	30.6	3363	4.0	25.9	2.0
MAR.	0.3	176.0	4.7	101859	27955	27.3	3668	3.6	25.6	2.3
APR.	0.6	47.0	3.4	26175	9030	34.5	1026	3.9	23.9	1.3
MAY.	0.2	161.0	3.3	75383	25665	34.0	3826	5.1	23.8	1.3
JUNE	0.4	191.5	3.8	132548	34620	26.1	4754	3.6	23.7	2.0
JULY	0.6	130.0	3.9	83371	21175	25.4	3664	4.4	23.9	1.6
AUG.	0.4	150.5	4.1	81315	22990	28.3	4094	5.1	25.9	1.5
SEPT.	0.4	158.5	4.4	121988	30310	24.8	4113	3.4	24.7	2.2
OCT.	0.4	190.0	4.6	138513	36562	26.4	4815	3.5	25.5	2.0
NOV.	0.3	153.5	4.2	138327	33000	23.9	4110	3.0	24.0	2.5
DEC.	0.4	182.8	4.1	124838	35105	28.1	4656	3.7	24.5	2.0
TOTAL	-	1831.3	-	1203146	322167	-	45059	-	-	-
AVG.	0.4	152.6	4.1	100262	26847	26.8	3755	3.7	25.1	1.9

COMMENTS

The concentrations of total solids in the sludge being filtered were less than that of the previous year. This is reflected in the increased hours of operation (1,831.3 hours in 1967 compared to 1,950.0 hours in 1966), greater chemical dosages and lower yields.

DIGESTER OPERATION

MONTH	SLUDGE TO DIGESTERS			SLUDGE FROM DIGESTERS		
	1000'S GALLONS	% SOLIDS	% VOL MAT	1000'S GALLONS	% SOLIDS	% VOL MAT
JAN	168.814	-	-	68.573	-	-
FEB	145.207	6.0	73.60	201.738	3.3	61.80
MAR	133.121	5.5	70.90	125.395	3.9	60.31
APR	178.004	-	-	76.723	3.3	59.77
MAY	275.313	3.4	56.80	226.497	3.1	31.30
JUNE	311.359	3.6	57.96	300.299	3.8	59.36
JULY	323.529	3.8	53.80	213.268	3.5	38.79
AUG.	194.905	7.3	68.00	105.537	4.1	53.10
SEPT.	401.540	7.0	53.00	24.048	4.1	53.40
OCT.	232.623	5.6	64.50	227.859	4.5	51.80
NOV.	349.449	6.8	54.30	246.850	4.4	45.10
DEC.	310.346	7.1	-	313.274	3.9	-
TOTAL	3024.210	-	-	2130.061	-	-
AVG.	252.017	5.6	61.43	177.505	3.8	51.47

COMMENTS

From the data supplied above, the reduction in volatile solids was determined to be approximately 34%. Excellent digester operation will provide a volatile solids reduction of 46% for the same volatile solids concentration in the raw sludge. It is hoped that the efficiency of this operation will be increased in the future with slight modification to the treatment process.

CHLORINATION

MONTH	PLANT FLOW (MG)	POUNDS CHLORINE	DOSAGE RATE (PPM)
JANUARY	148.426	5495	3.70
FEBRUARY	148.493	5070	3.41
MARCH	176.870	5830	3.30
APRIL	194.201	5490	2.82
MAY	168.955	6080	3.60
JUNE	188.412	5450	2.89
JULY	184.034	5580	3.03
AUGUST	168.113	5720	3.40
SEPTEMBER	162.450	5210	3.20
OCTOBER	168.857	4350	2.58
NOVEMBER	175.542	5120	2.91
DECEMBER	195.132	5190	2.84
TOTAL	2079.485	64585	-
AVERAGE	173.290	5382	3.14

COMMENTS

During the year 64,585 pounds of chlorine were used to chlorinate the final effluent. The objective was to maintain a chlorine residual of 0.5 ppm after a 15 minute contact period with the effluent. A dosage rate of 3.14 ppm was required to meet this objective.

Date Due

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CONCLUSIONS

The data in this report serve as a useful reference for future needs at the Galt Water Pollution Control Plant. The data will be especially valuable during the design of a plant expansion.

During the year, the plant produced a good effluent having average values of BOD and SS concentration of 14.2 ppm and 24 ppm respectively.

RECOMMENDATIONS

The high hydraulic loading at the plant (i.e. the design flow was exceeded 95.5 percent of the time) caused considerable scouring of raw sludge in the primary clarifiers. As a result a poorly concentrated sludge and supernatant was experienced in the digester operation. It is, therefore, recommended that proceedings for expansion be speeded up to eliminate the hydraulic loading problem at the plant.

